BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

PATENT

I hereby certify that on the date specified below, this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to the Commissioner for Patents, Washington, DC 20231.

6/11/01 — Jeanne Connelly

Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Jeffrey Chan et al.
Application No.	:	09/749,303 Confirmation No.: 5430
Filed	:	December 27, 2000
For	:	METHOD AND SYSTEM FOR ANALYZING PERFORMANCE OF A TURBINE
Docket No.	:	243768021US
Date	:	June 11, 2001

Commissioner for Patents
Washington, DC 20231

TRANSMITTAL OF FORMAL DRAWINGS

Sir:

Enclosed please find 13 sheets of formal drawings (Figures 1-13) for the above-identified application.

Respectfully submitted,
Perkins Coie LLP

Maurice J. Pirio
Registration No. 33,273

MJP:jc

Enclosures:
13 Sheets of Drawings

PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247
(206) 583-8888
FAX: (206) 583-8500

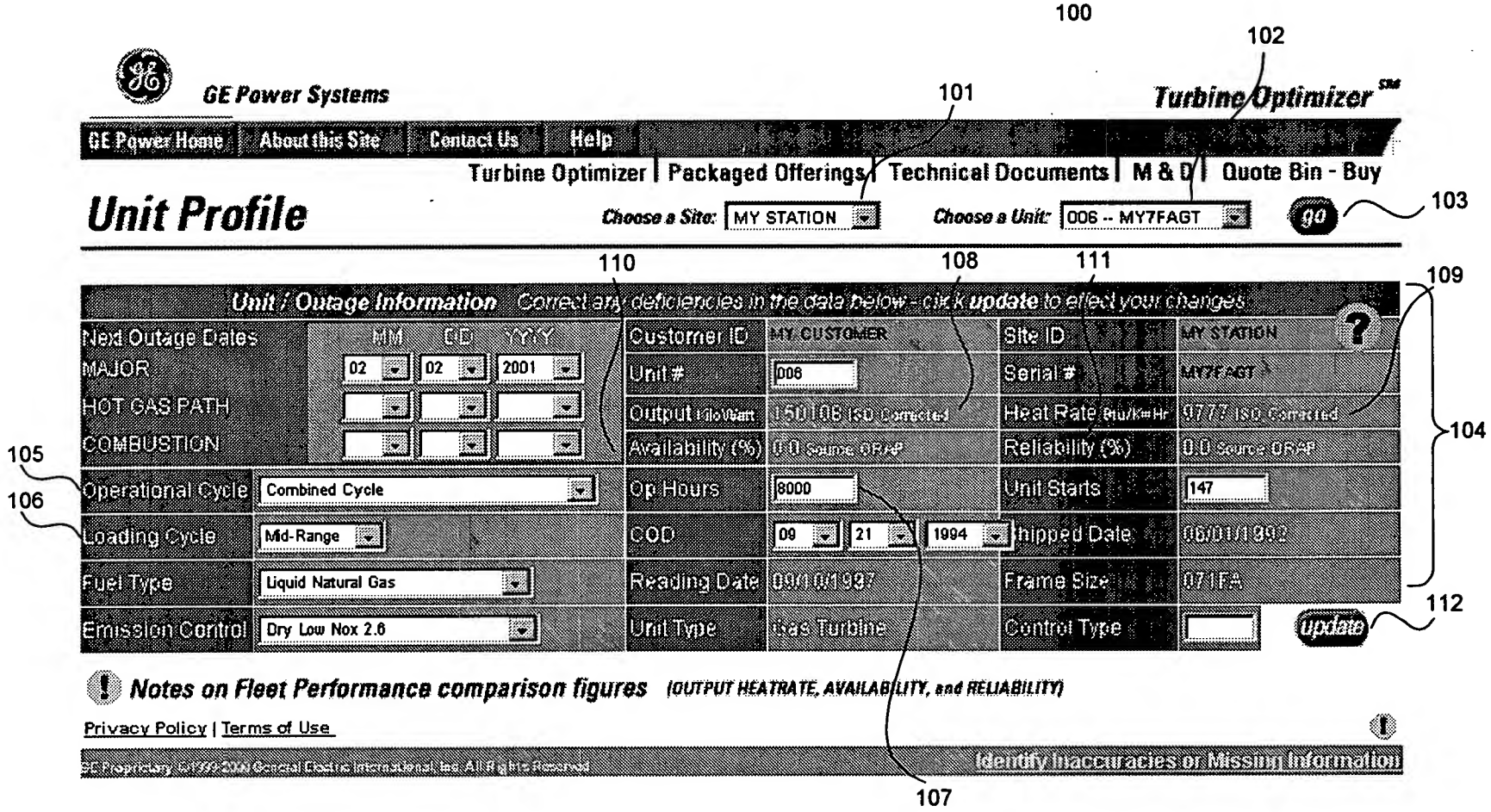
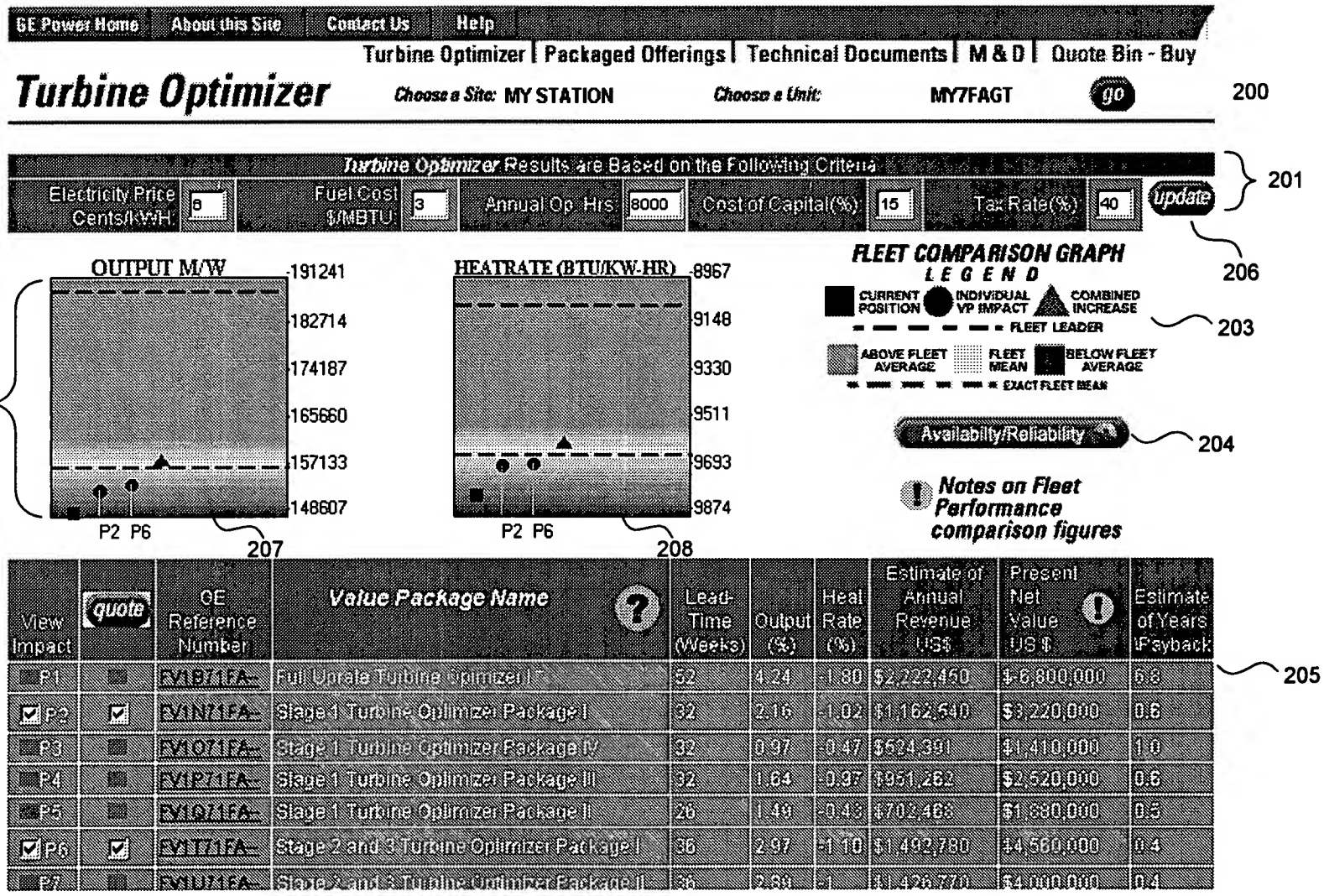

100
102
101
GE Power Systems
Turbine Optimizer SM
GE Power Home
About this Site
Contact Us
Help
Turbine Optimizer
Packaged Offerings
Technical Documents
M & D
Quote Bin - Buy
Unit Profile
Choose a Site: MY STATION
Choose a Unit: 006 -- MY7FAGT
go
103
110
108
111
109
Unit / Outage Information Correct any deficiencies in the data below - click update to effect your changes
Next Outage Dates
MM DD YYYY
MAJOR 02 02 2001
HOT GAS PATH
COMBUSTION
Customer ID MY CUSTOMER
Site ID MY STATION
Unit # 006
Serial # MY7FAGT
Output kiloWatt 150108 Iso Corrected
Heat Rate Btu/kwHr 9777 Iso Corrected
Availability (%) 0.0 Source GPAP
Reliability (%) 0.0 Source GPAP
104
105
Operational Cycle Combined Cycle
Op Hours 8000
Unit Starts 147
106
Loading Cycle Mid-Range
COD 09 21 1994
Shipped Date 06/01/1992
Fuel Type Liquid Natural Gas
Reading Date 09/01/1997
Frame Size 7FA
Emission Control Dry Low Nox 2.6
Unit Type Gas Turbine
Control Type
update
112
Notes on Fleet Performance comparison figures (OUTPUT HEATRATE, AVAILABILITY, and RELIABILITY)
Privacy Policy | Terms of Use
GE Proprietary ©1999-2000 General Electric International, Inc. All Rights Reserved
Identify Inaccuracies or Missing Information
107

Fig. 1

Fig. 2


GE Power Home
About this Site
Contact Us
Help
Turbine Optimizer | Packaged Offerings | Technical Documents | M & D | Quote Bin - Buy
Turbine Optimizer
Choose a Site: MY STATION
Choose a Unit: MY7FAGT
go
200
Turbine Optimizer Results are Based on the Following Criteria
Electricity Price Cents/KWH 6
Fuel Cost $/MBTU 3
Annual Op Hrs 8000
Cost of Capital(%) 15
Tax Rate(%) 40
update
201
206
OUTPUT M/W
191241
182714
174187
165660
157133
148607
P2 P6
207
HEATRATE (BTU/KW-HR)
8967
9148
9330
9511
9693
9874
P2 P6
208
202
FLEET COMPARISON GRAPH
LEGEND
CURRENT POSITION
INDIVIDUAL VP IMPACT
COMBINED INCREASE
FLEET LEADER
203
ABOVE FLEET AVERAGE
FLEET MEAN
BELOW FLEET AVERAGE
EXACT FLEET MEAN
Availability/Reliability
204
Notes on Fleet Performance comparison figures
View Impact
quote
OE Reference Number
Value Package Name
Lead-Time (Weeks)
Output (%)
Heat Rate (%)
Estimate of Annual Revenue US$
Present Net Value US $
Estimate of Years Payback
P1 FV1B71FA- Full Uprate Turbine Optimizer I 52 4.24 -1.80 $2,222,450 $6,800,000 6.3
P2 FV1N71FA- Stage 1 Turbine Optimizer Package I 32 2.16 -1.02 $1,162,540 $3,220,000 0.6
P3 FV1O71FA- Stage 1 Turbine Optimizer Package IV 32 0.97 -0.47 $524,391 $1,410,000 1.0
P4 FV1P71FA- Stage 1 Turbine Optimizer Package III 32 1.64 -0.97 $951,262 $2,520,000 0.6
P5 FV1Q71FA- Stage 1 Turbine Optimizer Package II 26 1.49 -0.43 $703,468 $1,890,000 0.5
P6 FV1T71FA- Stage 2 and 3 Turbine Optimizer Package I 36 2.97 -1.10 $1,492,780 $4,560,000 0.4
P7 FV1U71FA- Stage 2 and 3 Turbine Optimizer Package II 36 2.50 -1 $1,426,730 $4,000,000 0.4
205

Uprate Performance Impact Matrix

300

	301 Customer Name	302 SN		303 Current Rating	304 Stg1	S1B, S1S	S1N, S1S	S1B, S1N	86 IGV	CDC/ HPP	S2B, S2S	S3B, S3S	S2B, S2S, S3B, S3S	Stg2, Stg3	Performance Impact (parts only)
305	ACME	297031	Output	*163272*	0.64	0.31	0.70	0.13	0.00	0.00	0.08	-0.03	0.09	0.59	1.30
	Tf=2420, IGV=90		HR	*9623*	-0.51	0.02	-0.55	0.36	0.00	0.00	0.02	0.07	0.03	-0.20	-0.77
306	Smith	297112	Output	*165151*	0.54	0.21	0.70	0.03	0.00	0.00	0.08	-0.03	0.09	0.59	1.20
	Tf=2420		HR	*9461*	-0.51	0.02	-0.55	0.36	0.00	0.00	0.02	0.07	0.03	-0.20	-0.77

304

Tf	Sum Parts+ Tf	Cycle Deck Run	FV1B	FV1P	FV1T	FV1U	FV1V	FV1W	FV1N	FV1O	FV1Q	FV4B	FV4P	FV4T	FV4U	FV4V
0	1.3		1.3	0.313	0.594	0.086	0.0799	-0.033	0.639	0.6993	0.125	n/a	n/a	n/a	n/a	n/a
0	-0.77		-0.77	0.02	-0.198	0.026	0.02	0.0733	-0.506	-0.553	0.363	n/a	n/a	n/a	n/a	n/a
0	1.3		1.2	0.313	0.594	0.086	0.0799	-0.033	0.639	0.6993	0.125	n/a	n/a	n/a	n/a	n/a
0	-0.77		-0.77	0.02	-0.198	0.026	0.02	0.0733	-0.506	-0.553	0.363	n/a	n/a	n/a	n/a	n/a

Fig. 3

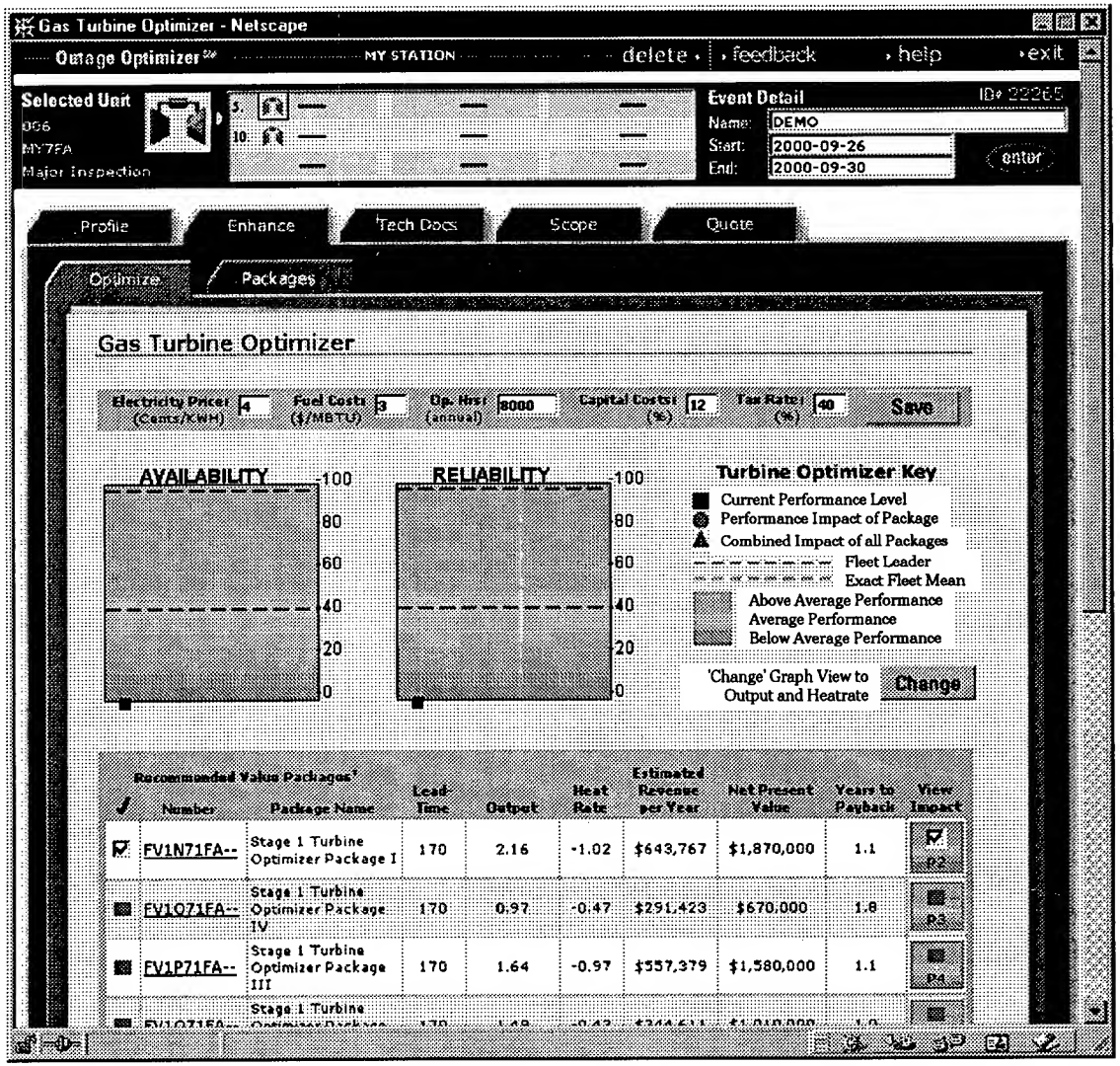

Gas Turbine Optimizer - Netscape
Outage Optimizer
MY STATION
delete
feedback
help
exit
Selected Unit
006
MY7FA
Major Inspection
Event Detail
ID# 22265
Name: DEMO
Start: 2000-09-26
End: 2000-09-30
enter
Profile
Enhance
Tech Docs
Scope
Quote
Optimize
Packages
Gas Turbine Optimizer
Electricity Price (Cents/KWH) 4
Fuel Costs ($/MBTU) 3
Op. Hrs (annual) 8000
Capital Costs (%) 12
Tax Rate (%) 40
Save
AVAILABILITY
RELIABILITY
100
80
60
40
20
0
Turbine Optimizer Key
Current Performance Level
Performance Impact of Package
Combined Impact of all Packages
Fleet Leader
Exact Fleet Mean
Above Average Performance
Average Performance
Below Average Performance
'Change' Graph View to Output and Heatrate
Change
Recommended Value Packages*
Number
Package Name
Lead Time
Output
Heat Rate
Estimated Revenue per Year
Net Present Value
Years to Payback
View Impact
FV1N71FA--
Stage 1 Turbine Optimizer Package I
170
2.16
-1.02
$643,767
$1,870,000
1.1
FV1Q71FA--
Stage 1 Turbine Optimizer Package IV
170
0.97
-0.47
$291,423
$670,000
1.8
FV1P71FA--
Stage 1 Turbine Optimizer Package III
170
1.64
-0.97
$557,379
$1,580,000
1.1

Fig. 4

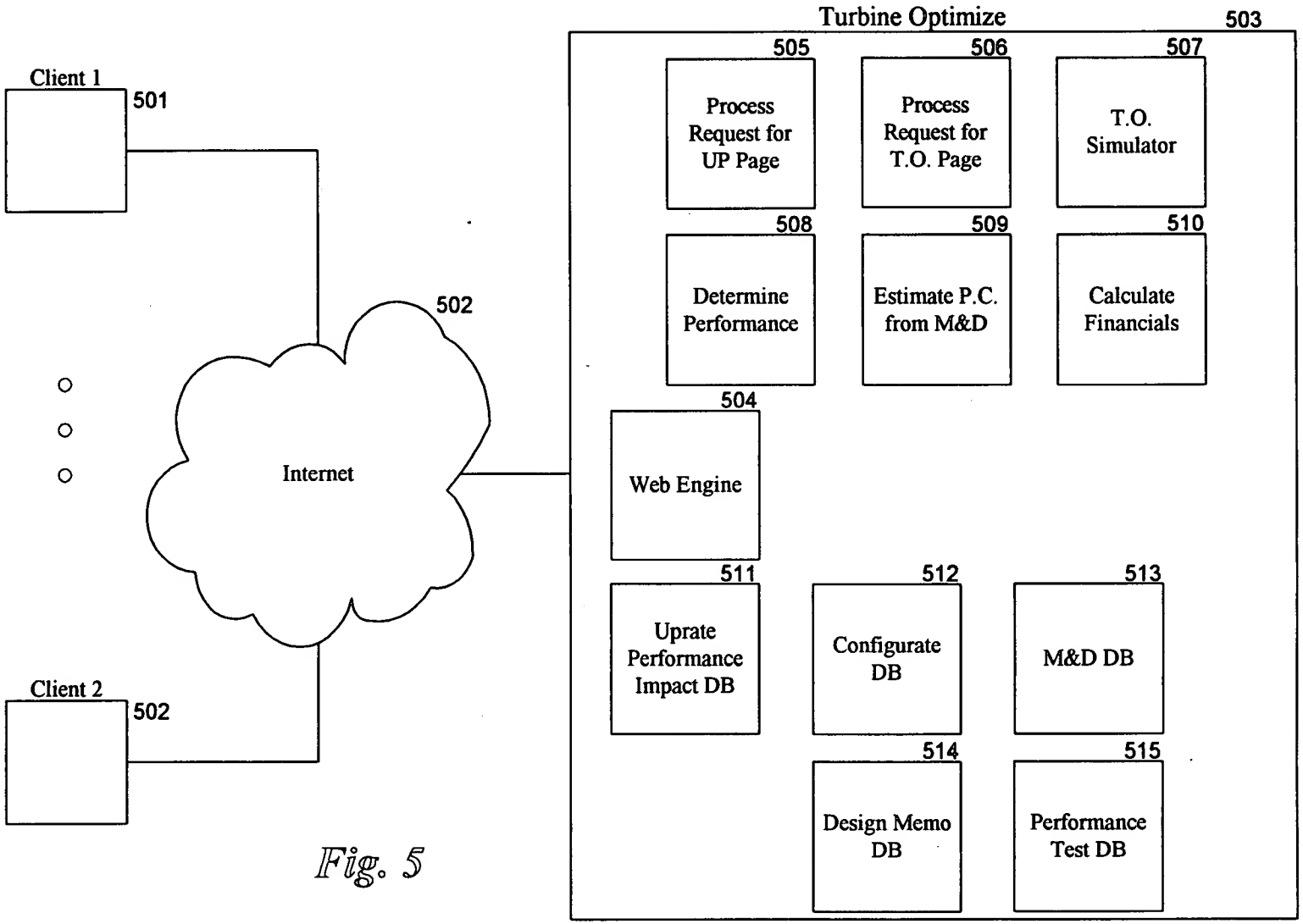


Fig. 5

(Site, Unit)

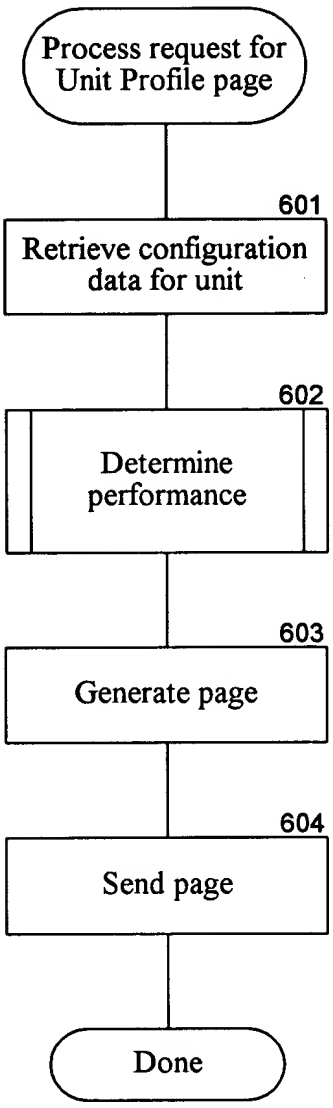


Fig. 6

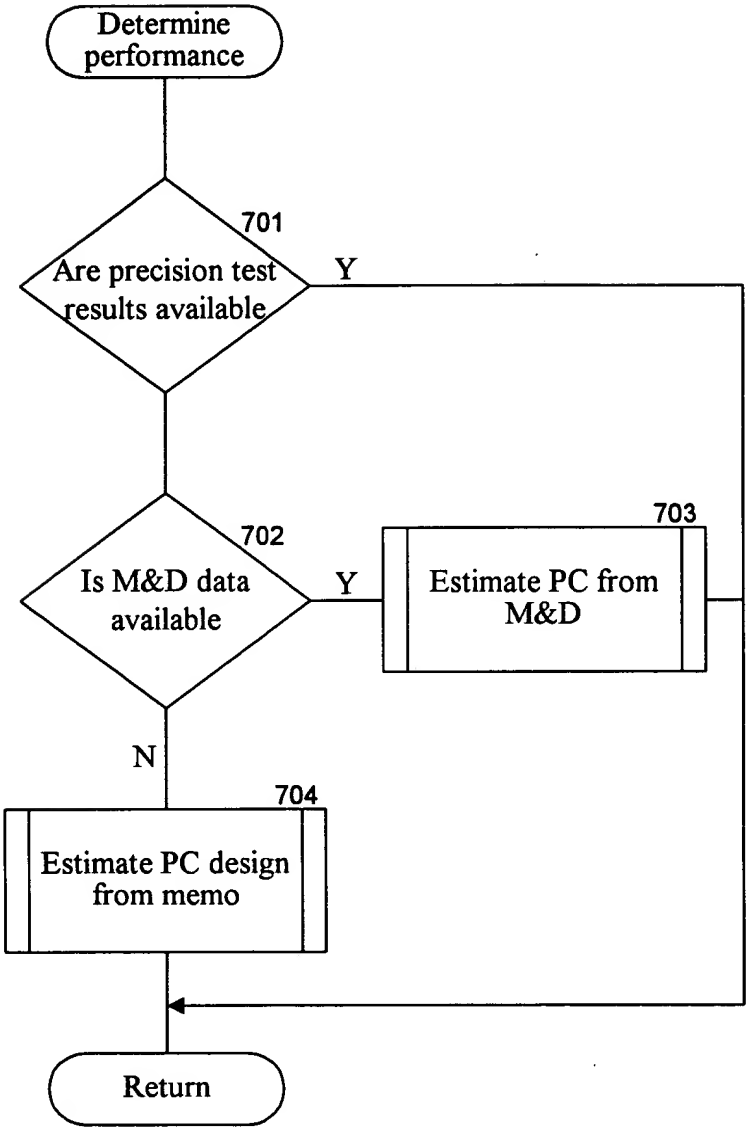

Determine performance
701
Are precision test results available
Y
702
Is M&D data available
Y
703
Estimate PC from M&D
N
704
Estimate PC design from memo
Return

Fig. 7

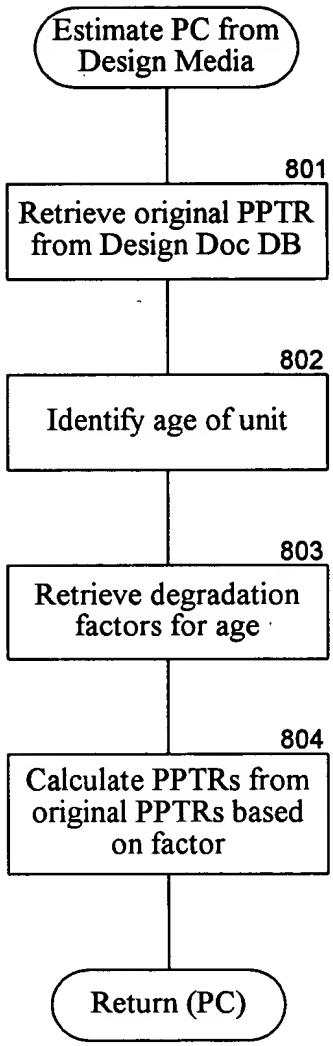

Estimate PC from Design Media
801
Retrieve original PPTR from Design Doc DB
802
Identify age of unit
803
Retrieve degradation factors for age
804
Calculate PPTRs from original PPTRs based on factor
Return (PC)

Fig. 8

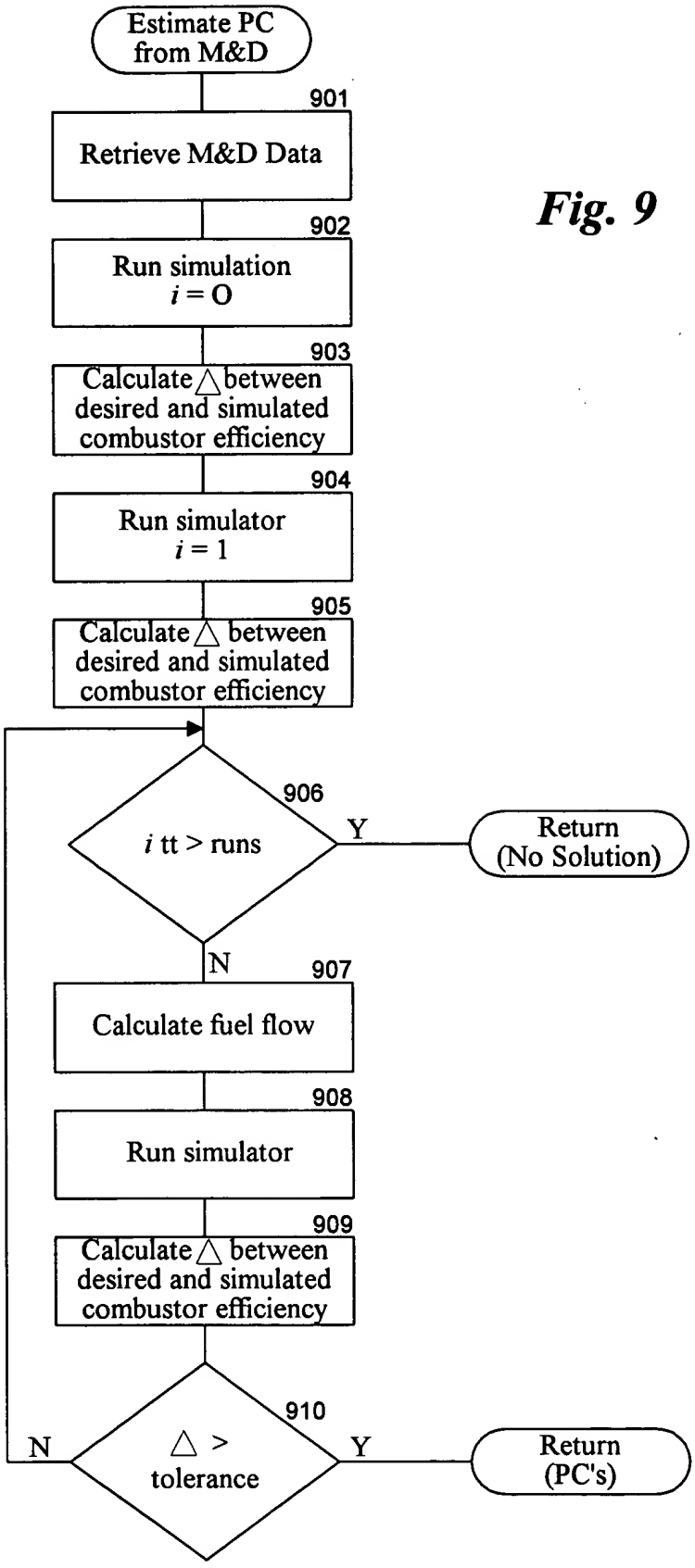

Estimate PC from M&D
901
Retrieve M&D Data
902
Run simulation
i = O
903
Calculate △ between desired and simulated combustor efficiency
904
Run simulator
i = 1
905
Calculate △ between desired and simulated combustor efficiency
906
i tt > runs
Y
Return (No Solution)
N
907
Calculate fuel flow
908
Run simulator
909
Calculate △ between desired and simulated combustor efficiency
910
△ > tolerance
N
Y
Return (PC's)

Fig. 9

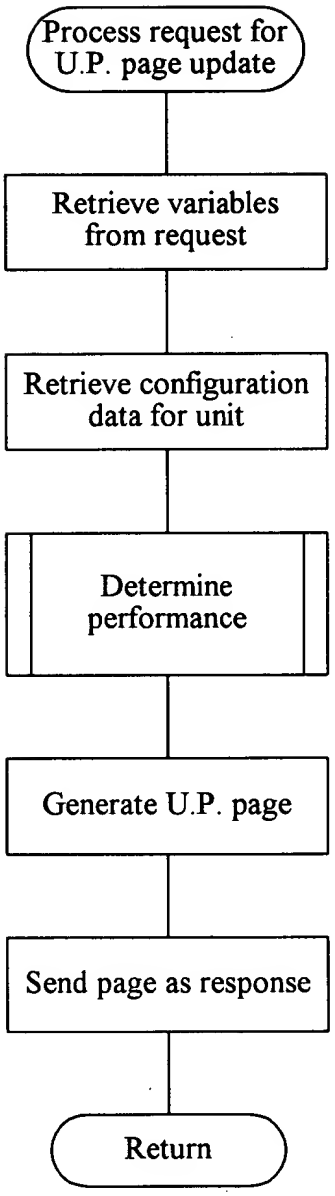

Process request for U.P. page update
Retrieve variables from request
Retrieve configuration data for unit
Determine performance
Generate U.P. page
Send page as response
Return

Fig. 10

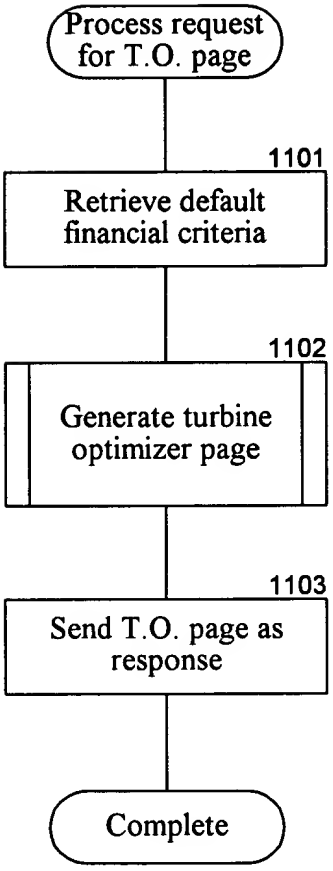

Process request for T.O. page
1101
Retrieve default financial criteria
1102
Generate turbine optimizer page
1103
Send T.O. page as response
Complete

Fig. 11

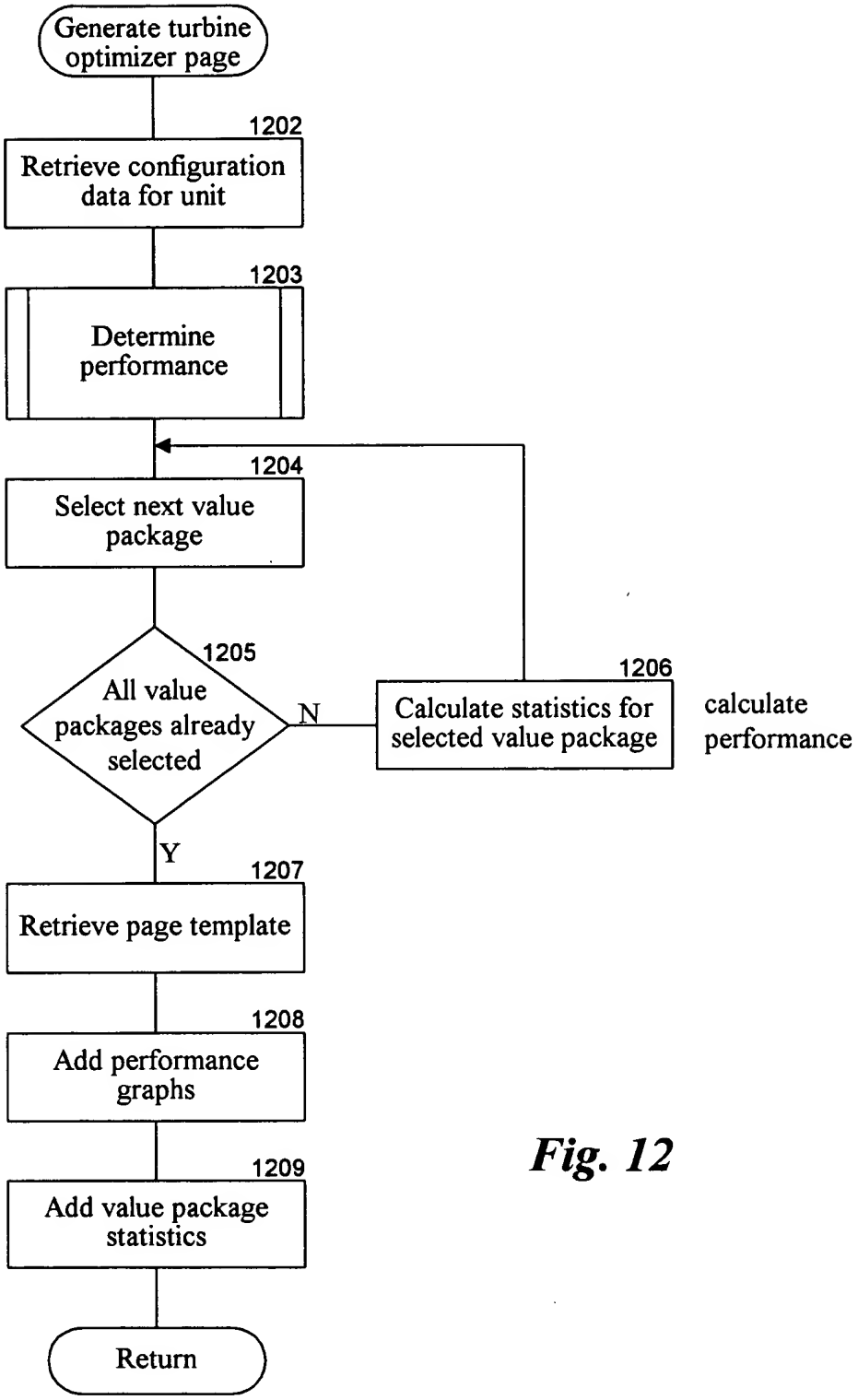

Generate turbine optimizer page
1202
Retrieve configuration data for unit
1203
Determine performance
1204
Select next value package
1205
All value packages already selected
N
1206
Calculate statistics for selected value package
calculate performance
Y
1207
Retrieve page template
1208
Add performance graphs
1209
Add value package statistics
Return

Fig. 12

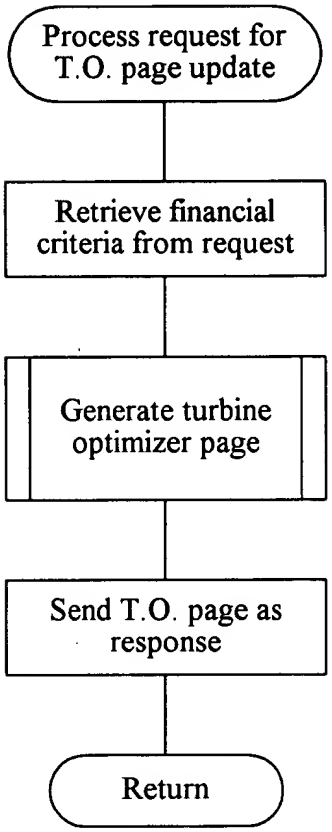

Process request for T.O. page update
Retrieve financial criteria from request
Generate turbine optimizer page
Send T.O. page as response
Return

Fig. 13